Rhoeo spathacea. OYSTER PLANT; MOSES-IN-A-BOAT. *Season*: winter. *Pollen*: white; great quantities. *Nectar*: apparently none. (27). Sap may cause skin rash (22).

Salvia coccinea. RED SAGE. *Season*: mainly Feb. and Mar. Bees observed working the flowers (22).

Zebrina pendula. WANDERING JEW. *Season*: Nov. to Feb. *Pollen*: grayish-white; bees gather avidly. *Nectar*: apparently none. It was first noticed in Puerto Rico that the plant was visited by bees in cane fields and coffee plantations (27). Commonly grown as an ornamental in Florida, it has escaped into the fields at South Bay and Belle Glade (13).

Cacti

Cereus peruvianus. APPLE CACTUS. *Season*: several times a year. *Pollen*: probably abundant; many bees seen traveling up and down pistil eagerly (31).

Pereskia aculeata. BARBADOS GOOSEBERRY; LEMON VINE. *Season*: late summer and early fall. *Pollen*: plentiful and gathered by bees. *Nectar*: worked all day (34). "Each blossom with a bee feasting on its nectar" (Mabel Dorn, *Trop. Gardening for South Florida*, p. 136).

ADDENDA

I observed many honeybees working **Colvillea racemosa** and **Coleus blumei** in Nov.; **Calliandra haematocephala** in Jan. Wadlow reported bees working **Vitex trifolia** in Nov. V. E. Green says bees visit **Hylocereus undatus**, early mornings, July-Oct.

LITERATURE AND PERSONS CITED

1. Arnold, L. E. Some Honey Plants of Florida. Bul. 548. U. of Fla. Agr. Exp. Sta., Gainesville. 1954.
2. Baker, M. F. Florida Wild Flowers. The Macmillan Co., N.Y. 1938; reprinted 1949.
3. Blake, S. T. and C. Roff. The Honey Flora of Queensland. Dept. of Agr. & Stock, Brisbane, Aust. 1959.
4. Borden, J. Perrine, Fla.
5. Buswell, W. M. Native Shrubs of South Florida. U. of Miami, Coral Gables. 1946.
6. Buswell, W. M. Native Trees and Palms of South Florida. U. of Miami, Coral Gables, 1945.
7. Cook, J. Palm Apiaries, Ft. Myers.
8. Diller, I. 3437 S.W. 29 St., Miami, Fla.
9. Eckert, J. E. and H. A. Bess. Fundamentals of Beekeeping in Hawaii. Exten. Bul. 55. U. of Hawaii, Honolulu. 1952.
10. Genung, W. G. and R. Allen. Everglades Exp. Sta., Belle Glade, Fla.
11. Graenicher, S. Bee-fauna and Vegetation of the Miami Region of Florida. Ann. Entom. Soc. of Amer. Vol. 23, pp. 153-174. 1930.
12. Greene, W. H. and H. L. Blomquist. Flowers of the South, Native and Exotic. U. of N. Carolina Press, Chapel Hill, N. C. 1953.
13. Hardy, L. 2466 N.W. 91 St., Miami
14. Haynie, J. H. Hum of the Hive newsletter, U. of Fla. Agr. Ext. Serv., Gainesville. Feb. 15, 1964.
15. Irvine, F. R. Woody Plants of Ghana. Oxford U. Press, London. 1961.
16. Ledin, R. B. The Compositae of South Florida. U. of Miami Press, Coral Gables. 1951.
17. Little, J. Everglades Exp. Sta., Belle Glade, Fla.
18. Lovell, H. B. Honey Plants Manual. A. I. Root Co., Medina, Ohio. 1956.
19. Lovell, J. H. Honey Plants of North America. A. I. Root Co., Medina, Ohio. 1926.
20. Markham, F. Markham Apiary, Belle Glade, Fla.
21. Meyer, R. F. Mar-Ray Apiaries, Opa-locka, Fla.
22. Morton, J. F., Morton Collectanea, U. of Miami, Coral Gables, Fla.
23. Motes, W. D., Rt. 1, Ft. Meade, Fla.
24. Oertel, E. Honey and Pollen Plants of the U. S. Cir. 554. U. S. Dept. Agr. 1939.
25. Oertel, E. Honey Bees in Production of White Clover Seed in the Southern States. ARS-33-60. U.S. Dept. Agr., Agr. Res. Serv. 1960.
26. O'Ferrell, R. LaBelle, Fla.
27. Ordetx Ros, G. S. Flora Apicola de la America Tropical. Editorial Lex, Havana, Cuba. 1952.
28. Pope, W. T. Manual of Wayside Plants of Hawaii. Advertiser Pub'g Co., Ltd., Honolulu. 1929.
29. Rice, R. R. 5880 N.W. 22 Ave., Miami, Fla.
30. Small, J. K. Manual of the Southeastern Flora. 1933. Reprinted by U. of North Carolina Press, Chapel Hill. 1953.
31. Steely, F. L. 17175 S.W. 232 St., Homestead, Fla.
32. Vansell, G. H. Beekeeping for the Beginner in California. Cir. 36. U. of Calif. Agr. Exten. Serv., Berkeley. 1929.
33. Vansell, G. H. Nectar and Pollen Plants of California. Bul. 517. Calif. Agr. Exten. Serv. 1931.
34. Wadlow, R. V. P. O. Box 631, Immokalee, Fla.
35. Watson, J. S. The Anabasis, or Expedition of Cyprus and the Memorabilia of Socrates (Trans. from the Greek of Xenophon). Harper & Bros., N.Y. 1875.
36. West, E. and L. E. Arnold. The Native Trees of Florida. Rev'd ed. U. of Florida Press, Gainesville. 1956.
37. Worley, E. 2569 N.E. 183 St., Miami.
38. Yeomans, T. LaBelle, Fla.

OTHERS ARE NAMED IN THE TEXT

THE EFFECT OF RADIATION ON MOLD POPULATIONS ON FRESH LYCHEES

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Mold has been long established as a problem for fruit growers and processors. The fresh market potential of lychee fruit has not been fully realized, partially due to their high susceptibility to fungus. Thus, control of mold on lychee fruits is vitally important to this infant industry.

Various methods have been applied to control the growth of mold on lychees. In 1958 Dennison and Hall (3) reported that the use of dehydroacetic acid and chlortetracycline slightly extended the shelf life of fresh lychees. Dennison (2) made

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[2]The basic unit of radiation used is the rad, defined as 100 ergs of energy absorbed per gm of biological tissue. The kilorad (abbreviated KR) is equal to 1,000 rads.

the first studies with irradiated lychees, but the results were inconclusive.

A quantitative assay of mold populations on fresh irradiated lychees is reported herein.

Experimental

Fresh lychees of uniform size and maturity of the 'Brewster' variety from the Goulds area were used. The fruits were irradiated at each of 4 radiation levels: a control (0 KR[2]), 50 KR, 200 KR, and 500 KR. For each radiation level there were 3 storage intervals, and for each storage interval there were 3 replications.

The fruits were irradiated and stored in 8-pound Kraft bags, each bag containing 10 fruits. They were stored at 50°F, and one-third were examined each week beginning July 7, 1964, providing for storage intervals of 1, 2, and 3 weeks.

Upon removal from storage, the fruits from each bag were transferred into a sterile, standard quart jar containing 500 ml of sterile distilled water. After the lid was tightened, the jar was shaken vigorously for 10 seconds in a 45° arc. Sixty seconds were allowed for settling, after which the shaking process was repeated. This "dipping" technique removed a uniform portion of the surface mold from each fruit. Appropriate dilutions of the mold suspension were then pipetted into sterile culture dishes. Duplicate plates were prepared for each dilution.

The culture medium was mycological agar fortified with an additional one percent agar-agar and prepared with a 0.02 M citrate buffer solution of pH 4.0.

After a 6-day incubation period at 25°C, the mold colonies were counted. Counts were transformed to number of molds per cm² of the fruit surface area.

Results and Discussion

The mean mold colony counts of the 3 replications for each storage interval and radiation level are given in Table 1. The data are shown graphically in Figure 1.

The results of the first storage interval provided evidence that the radiation had a marked effect on the mold populations. At 200 KR, the mold colony count was only about one-third that of the control. At 500 KR, the count was negligible, being less than 10 percent of the control

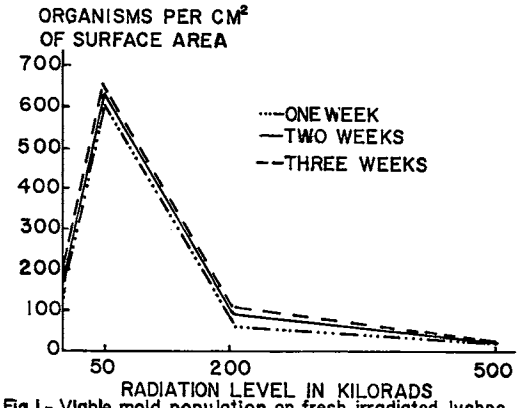

Fig. 1.- Viable mold population on fresh irradiated lychee fruit after one, two, and three weeks of storage at 50°F.

Table 1.--Mean[1] counts of mold colonies on irradiated lychee fruit after storage at 50°F.

Radiation level (KR)	Storage interval in weeks		
	1	2	3
0	196	200	230
50	581	601	639
200	65	68	75
500	15	15	15

[1]Average of replications reported as molds per cm² of surface area

count. However, the sudden increase of molds on the fruit exposed to 50 KR was unexpected. Since the results of the second and third storage intervals confirmed the observations of the first, the high counts at the 50 KR treatments were not attributable to contamination or faulty procedure.

As the storage interval was extended, there was a small, general increase in mold population. Although mold mycelium did not produce countable colonies in the recovery technique, there was a slight increase in viable mold spores with extended storage intervals. Mycelial growth did occur on fruits in the control and on several fruits in the 50 and 200 KR treatments. However, the mycelial activity did not result in a prolific increase in viable mold spores which were countable.

It had been hypothesized that sub-lethal levels of radiation administered to a mold population would result in partial inactivation of mold cells. The observation of a tripled count in the 50 KR treatment compared to the control was at variance with this theory. A similar phenomenon has been observed recently with irradiated peaches (4). The sub-lethal dosage may have stimulated non-viable cells into germination, or may have inactivated selected microbiological species, the abscence of which may have allowed the activity of the otherwise non-viable mold cells.

Evidence to support the former theory has been demonstrated numerous times with heat-activation studies of bacterial spores (1). A valid conclusion, however, to explain the tripled mold count on fruit of the 50 KR treatment is impossible at this time.

LITERATURE CITED

1. Curran, H. R. and Evans, F. R. 1945. Heat activation inducing germination in bacterial spores of thermotolerant and thermophilic aerobic bacteria. Journal of Bacteriology 45: 335-336.
2. Dennison, R. A. 1959. The nutritive value and storage characteristics of Cobalt-60 irradiated food and feeds. Hatch Project 849, Progress Report. Florida Agricultural Experiment Stations, Gainesville.
3. Dennison, R. A. and C. B. Hall. 1958. Use of chemical treatments for the preservation of lychees. Proc. Fla. Lychee Growers Assoc. 5: 16-17.
4. Dennison, R. A., F. W. Knapp, G. D. Kuhn, and Margaret E. Merkley. 1964. Effects of low level irradiation upon the preservation of food products. June Report, Atomic Energy Commission, Contract No. AT (40-1)-3097, University of Florida, Department of Food Technology and Nutrition, Gainesville.

PHYTOPHTHORA ROOT AND STEM ROT OF ALOE

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The plant *Aloe barbadensis* Mill. is in the Liliaceae and produces a fleshy leaf that is valued for its medicinal properties. In South Florida it is a common dooryard plant and is also grown commercially for the pharmaceutical industry. The uses of aloe, and aloe culture were reviewed by Julia F. Morton (1).

Generally aloe plants thrive with minimal care under a variety of growing conditions in South Florida. However, an aloe farm located near Homestead, Florida, has been suffering from a serious decline problem for several years. The farm is located on low Rockdale limestone soil and parts of it have been subject to periodic flooding. Virtually all the plants located in the low section were flooded in 1960 and were dead when the farm was inspected in 1964. Throughout the rest of the farm diseased plants were numerous, and circular areas encompassing about 25 dead or dying plants were also present, Figure 1.

A survey of aloe plantings in Dade County indicated that the disease is restricted to the farm near Homestead. Mrs. Morton (personal communication) did not find the disease in a field in Belle Glade, Florida.

SYMPTOMS

Diseased plants in the early stages are recognized by their general unthrifty condition and often by a pinkish tinge on the tips of the small central leaves. The large outer leaves are flaccid, and in more advanced cases a black necrotic area is present at the base, Figure 4. Subsequently, the bases of the central leaves rot, and the leaves are easily pulled out or fall over by their own weight, Figure 2. These pinched-off leaves remain green for at least a month. Diseased plants are easily uprooted since the roots are almost completely rotted. The dark colored rot in the roots extends into the stem and to the leaf bases, causing them to fall over. Infection rarely goes

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